CLAIMS:

What is claimed is:

1. A flexible display device comprising:

a substrate; and

an active matrix display backplane coupled to said substrate.

2. The flexible display device as in claim 1 wherein said active matrix display backplane comprises a plurality of blocks that are deposited onto said substrate.

3. The flexible display device as in claim 1 wherein said active matrix display backplane comprises a plurality of blocks that are deposited onto a polarizing film.

4. The flexible display device as in claim 2 wherein said display device conforms to a desired shape of an object which is planar when said flexible display device is attached to said object.

5. The flexible display device as in claim 2 wherein said display device conforms to a desired shape of an object which is non-planar when said flexible display device is attached to said object.

6. The flexible display device as in claim 2 wherein each of said blocks comprises an active circuit element which drives a picture element.

7. The flexible display device as in claim 2 further comprising:

a display generation substrate coupled to said active matrix backplane.

8. The flexible display device as in claim 1 wherein said active matrix backplane comprises at least one electrode for each picture element.

9. The flexible display device as in claim 1 wherein said active matrix display is conformal.

10. The flexible display device as in claim 1 wherein the substrate is flexible.

11. A method of manufacturing a flexible active matrix display panel comprising:

depositing a plurality of shaped blocks onto a flexible substrate, each said block has a pixel electrode thereon; and

coupling electrically said plurality of blocks to form an active matrix backplane.

12. The method as in claim 11 wherein said display panel conforms to a desired shape of an object when said flexible display panel is attached to said object.

13. The method as in claim 11 wherein each of said shaped blocks comprises an active circuit element which drives a picture element.

14. The method as in claim 11 further comprising:

a display generation substrate coupled to said active matrix backplane.

15. The method as in claim 11 wherein said active matrix display backplane comprises at least one electrode for each picture element.

16. The method as in claim 11 wherein said active matrix display is conformal.

17. The method as in claim 11 wherein the flexible active matrix display panel comprises a single crystal silicon transmissive display.

18. The method as in claim 11 wherein the flexible active matrix display panel comprises a reflective display.

19. The method as in claim 11 wherein the flexible active matrix display panel comprises an organic light emitting diode.

20. The method as in claim 11 wherein the flexible active matrix display panel comprises an inorganic light emitting diode.

21. The method as in claim 11 wherein the flexible active matrix display panel comprises upconverting phosphor.

22. The method as in claim 11 wherein the flexible active matrix display panel comprises downconverting phosphor.

23. A flexible display device comprising:

a substrate;

a passive matrix display backplane coupled to said substrate; and

said passive matrix display backplane comprises a plurality of blocks that are deposited onto said substrate.

24. The flexible display device as in claim 23 wherein said display device conforms to a desired shape of an object which is planar when said flexible display device is attached to said object.

25. The flexible display device as in claim 23 wherein said display device conforms to a desired shape of an object which is non-planar when said flexible display device is attached to said object.

26. The flexible display device as in claim 23 wherein each of said blocks comprises a circuit element which drives a picture element.

27. The flexible display device as in claim 23 further comprising:

a display generation substrate coupled to said passive matrix backplane.

28. The flexible display device as in claim 22 wherein said passive matrix backplane has a picture element.

29. The flexible display device as in claim 22 wherein said passive matrix display is conformal.

30. The flexible display device as in claim 22 wherein the substrate is flexible.

31. A method of manufacturing a flexible passive matrix display panel comprising:

depositing a plurality of shaped blocks onto a flexible substrate; and

coupling electrically said plurality of blocks to form a passive matrix backplane.

32. The method as in claim 31 wherein said display panel conforms to a desired shape of an object when said flexible display panel is attached to said object.

33. The method as in claim 31 wherein each of said shaped blocks comprises a passive circuit element which drives a picture element.

34. The method as in claim 31 further comprising:

a display generation substrate coupled to said passive matrix backplane.

35. The method as in claim 31 wherein said passive matrix display backplane has a picture element.

36. The method as in claim 31 wherein said passive matrix display is conformal.

37. The method as in claim 31 wherein the flexible passive matrix display panel comprises a single crystal silicon transmissive display.

38. The method as in claim 31 wherein the flexible active matrix display panel comprises a single crystal silicon reflective display.

39. The method as in claim 31 wherein the flexible passive matrix display panel comprises an organic light emitting diode.

40. The method as in claim 31 wherein the flexible active matrix display panel comprises an inorganic light emitting diode.

41. The method as in claim 31 wherein the flexible passive matrix display panel comprises upconverting phosphor.

42. The method as in claim 31 wherein the flexible passive matrix display panel comprises downconverting phosphor.

43. A plurality of display device components comprising:

a flexible substrate having at least a first length;

said flexible substrate having a second length; and

a plurality of display device components coupled to said flexible substrate, each of said display device components is separated by at least a third length.

44. The plurality of display device components as in claim 43 wherein each of said display device components is assembled into a separate display device.

45. The plurality of display device components as in claim 43 wherein each of said flexible display device components has a backplane comprising a plurality of shaped blocks which are deposited onto said flexible substrate.

46. The plurality of display device components as in claim 44 wherein said separate display device components conform to a desired shape of an object which is non-planar when said separate display device is attached to said object.

47. The plurality of display device components as in claim 45 wherein each of said shaped blocks comprises a circuit element which drives a picture element.

48. The plurality of display device components as in claim 44 wherein each of said display device components forms a separate display backplane and a display generation substrate is coupled to each said separate display backplane.

49. The display device as in claim 48 wherein each said separate display backplane comprises at least one electrode for each picture element.

50. The display device as in claim 48 wherein each said display separate display backplane is a passive matrix display backplane.

51. The display device as in claim 48 wherein each said display backplane is an active matrix display backplane.

52. The display device as in claim 43 wherein the second length of the substrate is continuous.

53. A method of manufacturing a plurality of display panels on a flexible substrate, said method comprising:

creating a first display component on a first region of a flexible substrate, said flexible substrate having a first length and a second length;

creating a second display component on a second region of said flexible substrate, said second region being disposed along at least one of said first length and said second length from said first region by a third length, and wherein said first region is for a first display panel of said plurality of display panels and said second region is for a second display panel of said plurality of display panels.

54. The method as in claim 53 further comprising:

rolling said flexible substrate through a web processing apparatus.

55. A display device comprising:

a flexible substrate; and

a flexible reflective display backplane coupled to said flexible substrate.

56. The display device as in claim 55 wherein said flexible reflective display backplane comprises a plurality of shaped blocks which are deposited onto said flexible substrate.

57. The display device as in claim 56 wherein said display device conforms to a desired shape of an object when said flexible display device is attached to said object.

58. The flexible display device as in claim 56 wherein each of said shaped blocks comprises a circuit element which drives a picture element.

59. The display device as in claim 56 further comprising:

a display generation substrate coupled to said flexible reflective display backplane.

60. The display device as in claim 55 wherein said flexible reflective display backplane comprises at least one electrode for each picture element.

61. The display device as in claim 55 wherein said display is conformal.

62. The display device as in claim 55 wherein said substrate has at least one recessed region, said recessed region is reflective.

63. A method of processing a flexible substrate, said method comprising:

moving a flexible substrate through at least one web process apparatus;

dispensing a slurry containing a plurality of shaped objects onto said flexible substrate, said shaped objects being deposited onto receptor regions of said flexible substrate.

64. The method as in claim 63 wherein said flexible substrate moves at a rate of 5 inches per minute to 100 inches per minute.

65. The method as in claim 63 wherein a display tape moves at a rate of 5 inches per minute to 100 inches per minute.

66. The method as in claim 65 wherein the display tape comprises a material selected from the group of polyether sulfone (PES), polyethylene terephthalate, polycarbonate, polybutylene terephthalate, polyphenylene sulfide (PPS), polypropylene, polyester, aramid, polyamide-imide (PAI), polyimide, aromatic polyimides, polyetherimide, metallic materials, acrylonitrile butadiene styrene, and polyvinyl choloride.

67. A device for continuously feeding a flexible substrate and a display tape through a production line to form a display panel comprising:

a first drive belt disposed on a first plurality of support members to traverse a flexible substrate about a stationary point;

a second drive belt disposed on a second plurality of support members to traverse a display tape about the stationary point;

said flexible substrate disposed on a first drive belt wherein the flexible substrate has apertures;

a display tape deposited on the second drive belt wherein the display tape has apertures;

a slurry comprising a plurality of shaped blocks is placed onto the substrate;

a container stores excess slurry;

the first drive belt has adjustable fasteners corresponding to the apertures of the flexible substrate;

the second drive belt has adjustable fasteners corresponding to the apertures of the display tape; and

the flexible substrate is coupled to the display tape.

68. The device of claim 67 wherein the flexible substrate is comprised of the material selected from the group consisting of glass, plastic, and silicon.

69. The device of claim 67 wherein the display tape is comprised of the material selected from the group consisting of polyether sulfone (PES), polyester terephthalate, polycarbonate, polybutylene terephthalate, polyphenylene sulfide (PPS), polypropylene, polyester, aramid, polyamide-imide (PAI), polyimide, aromatic polyimides, polyetherimide, metallic materials, acrylonitrile butadiene styrene, and polyvinyl chloride.

70. The device of claim 67 wherein said apertures of the substrate are about evenly spaced.

71. The device of claim 67 wherein said apertures of the display tape are about evenly spaced.

72. The device of claim 63 wherein the display tape has a top surface and a bottom surface and at least one of the top surface and bottom surface has a metalization film.

73. The device of claim 67 wherein the display tape is heated.

74. The device of claim 63 wherein the display tape is patterned.

75. A method for continuously feeding a flexible substrate and a display tape through a production line to form a display panel comprising:

moving a flexible substrate and a display tape;

placing a slurry onto said flexible substrate said slurry having a plurality of shaped blocks which are designed to be received by receiving regions of said flexible substrate;

coupling said flexible substrate to said display tape;

coupling said flexible substrate to a backplane;

said display tape comprises the material selected from the group of polyether sulfone (PES), polyester terephthalate, polycarbonate, polybutylene terephthalate, polyphenylene sulfide (PPS), polypropylene, polyester, aramid, polyamide-imide (PAI), polyimide, aromatic polyimides, polyetherimide, metallic materials, acrylonitrile butadiene styrene, and polyvinyl chloride.

76. The method as in claim 75 wherein said display tape is flexible.

77. The method as in claim 75 wherein the display comprises an organic light emitting diode.

78. The method as in claim 75 wherein the display comprises a light emitting diode.

79. The method as in claim 75 wherein the display comprises an inorganic light emitting diode.

80. The method as in claim 75 wherein the display comprises an organic light emitting diode.

81. The method as in claim 75 wherein the display comprises cholesteric liquid crystal.

82. The method as in claim 75 wherein the display comprises upconverting phosphorus.

83. The method as in claim 75 wherein the display comprises downconverting phosphorus.

84. The method as in claim 75 wherein the display comprises electrophoretic material.

85. The method as in claim 75 wherein the display comprises liquid crystal.

86. The method as in claim 75 wherein the display comprises a polymer-dispersed liquid crystal.

87. A method of selectively placing an object onto a region of a substrate that forms a portion of a display panel, said method comprising:

dispensing a slurry containing a plurality of shaped objects onto a substrate, said shaped objects being deposited into recessed regions of the substrate;

checking for empty recessed regions in the substrate;

placing robotically an object into an empty recessed region of the substrate.

88. The method as in claim 87 further comprising coupling a display material to said substrate.

89. The method as in claim 87 wherein said substrate is rigid.

90. The method as in claim 87 wherein said substrate is flexible.

91. The method as in claim 87 wherein recessed regions are about a first size and about second size.

92. The method as in claim 91 wherein an object of about a first size is dispensed in a slurry onto the substrate, said at least one object is received into a region with a first size.

93. The method as in claim 92 wherein an object about the size of the region with a second size is dispensed in a slurry onto the substrate, said object is received into a region with a second size.

94. A method of placing objects onto a substrate, said method comprising:

dispensing a slurry containing a plurality of shaped objects onto a substrate, said shaped objects being deposited onto a first receptor region of said substrate;

grasping at least one object with a robotic arm and depositing said one object onto a second receptor region of said substrate.

95. The method as in claim 94 wherein said first receptor region is different in size than said second receptor region and both are recessed regions in said substrate.

96. The method as in claim 95 wherein said one object is different in size than each of said shaped objects.

97. The method as in claim 94 wherein said substrate is rigid.

98. The method as in claim 94 wherein said substrate is flexible and is processed through support members in a web process.

99. The method as in claim 94 wherein the first receptor region of said substrate is the equivalent size to the second receptor region of said substrate.

100. A method of depositing a display material through an in-line process on a flexible substrate to form a plurality of display panels, comprising the steps of:

depositing a display material onto the flexible substrate in a first region of the flexible substrate; and

depositing said display material on the flexible substrate in a second region of the flexible substrate, wherein said first region is for a first display panel and said second region is for a second display panel or another portion of said first display panel.

101. The method as in claim 100 wherein a backplane is coupled to the flexible substrate.

102. The method as in claim 100 wherein the backplane is flexible.

103. The method as in claim 100 wherein the display comprises a liquid crystal material.

104. The method as in claim 100 wherein the display material comprises an upconverting phosphorus.

105. The method as in claim 100 wherein the display material comprises a polymer-dispersed liquid crystal.

106. The method as in claim 100 wherein the display material comprises cholesteric liquid crystal.

107. The method as in claim 100 wherein the patterning of the display material is by laser etching.

108. The method as in claim 100 wherein the patterning of the display material is by an ink jet.

109. The method as in claim 100 wherein the patterning of the display material is by screen printing.

110. The method as in claim 100 wherein the patterning of the display material is by deposition.

111. The method as in claim 100 wherein the patterning of the display material is by lithography and etching.

112. The method as in claim 100 wherein a metal interconnect is deposited onto the first region of the substrate.